WHAT IS CLAIMED IS:

1. A block polymer comprising:
   i)   one or more cationic group-containing units; and
   ii) optionally one or more additional building block units;
   provided that the block polymer has an average cationic charge density of about 15 or less.

2. The block polymer according to Claim 1 wherein said block polymer further comprises:

   iii) one or more units having one or more hydroxyl groups,
         provided that said polymer has a Hydroxyl Group Density
         of about 0.5 or less.

3. The block polymer according to Claim 1 wherein said block polymer further comprises:

   iv)   one or more units having one or more hydrophobe groups
         selected from the group consisting of non-hydroxyl groups,
         non-cationic groups, non-anionic groups, non-carbonyl
         groups, and/or non-H-bonding groups.

4. The block polymer according to Claim 2 wherein said block polymer has a Hydroxyl Group Density of from about 0.0001 to about 0.4.

5. The block polymer according to Claim 1, wherein said polymer further comprises:
   v)   units capable of having an anionic charge at a pH of from about 4 to about 12;
   vi)   units capable of having an anionic charge and a cationic charge at a pH of from about 4 to about 12;
   vii) units having no charge at a pH of from about 4 to about 12; and
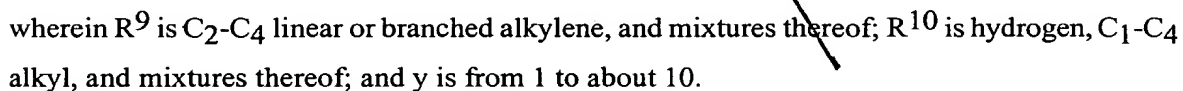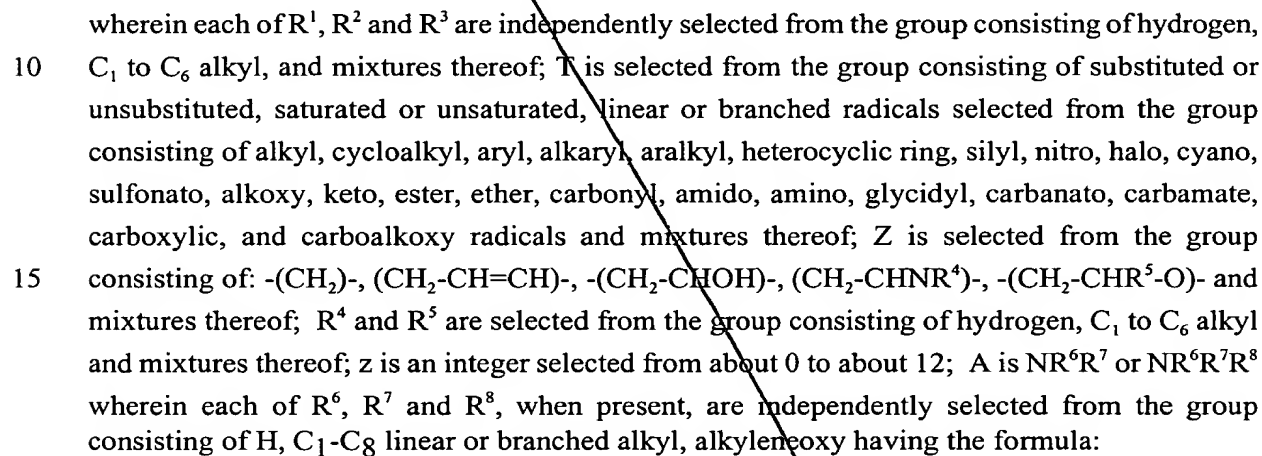   viii) mixtures of units (v), (vi), (vii), and (viii).

6. The block polymer according to Claim 5, wherein said polymer average cationic charge density ranges from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of about 4 to about 12.
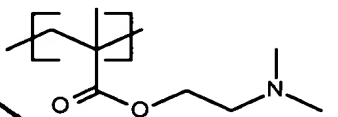
7. The block polymer according to Claim 1, wherein said polymer has an average molecular weight of from about 1,000 to about 2,000,000 daltons.

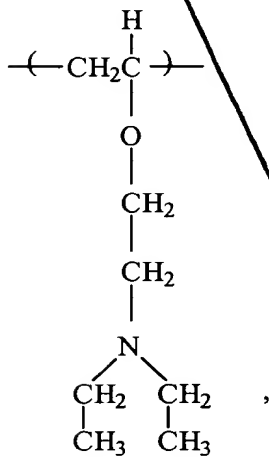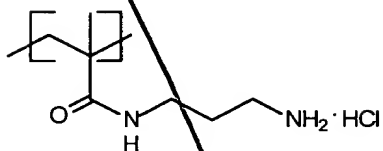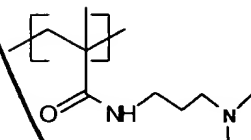8. The block polymer according to Claim 1, wherein said block polymer comprises a cationic unit of the formula:
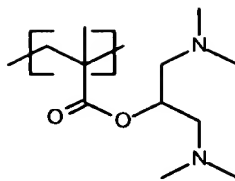
$$A-(Z)_z \overset{T}{\underset{}{\left[\begin{array}{c} R^2 \\ R^3 \end{array} \middle| \begin{array}{c} R^1 \end{array}\right]}}$$

[I]

wherein each of R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, C_1 to C_6 alkyl, and mixtures thereof; T is selected from the group consisting of substituted or unsubstituted, saturated or unsaturated, linear or branched radicals selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl, aralkyl, heterocyclic ring, silyl, nitro, halo, cyano, sulfonato, alkoxy, keto, ester, ether, carbonyl, amido, amino, glycidyl, carbanato, carbamate, carboxylic, and carboalkoxy radicals and mixtures thereof; Z is selected from the group consisting of: $-(CH_2)-$, $(CH_2-CH=CH)-$, $-(CH_2-CHOH)-$, $(CH_2-CHNR^4)-$, $-(CH_2-CHR^5-O)-$ and mixtures thereof; R^4 and R^5 are selected from the group consisting of hydrogen, C_1 to C_6 alkyl and mixtures thereof; z is an integer selected from about 0 to about 12; A is NR^6R^7 or $NR^6R^7R^8$ wherein each of R^6, R^7 and R^8, when present, are independently selected from the group consisting of H, C_1-C_8 linear or branched alkyl, alkyleneoxy having the formula:

$$—(R^9O)_y R^{10}$$

wherein R^9 is C_2-C_4 linear or branched alkylene, and mixtures thereof; R^{10} is hydrogen, C_1-C_4 alkyl, and mixtures thereof; and y is from 1 to about 10.
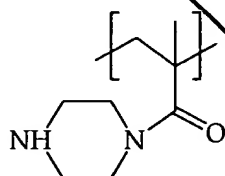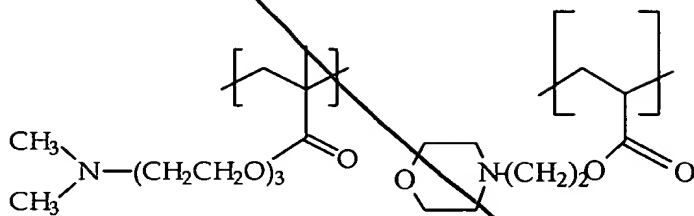
9. The block polymer according to Claim 1, wherein said block polymer comprises a cationic unit of the formula selected from the group consisting of:
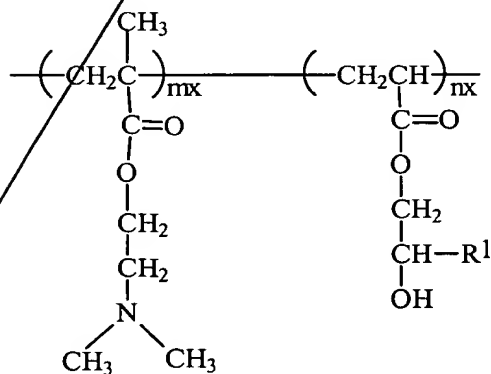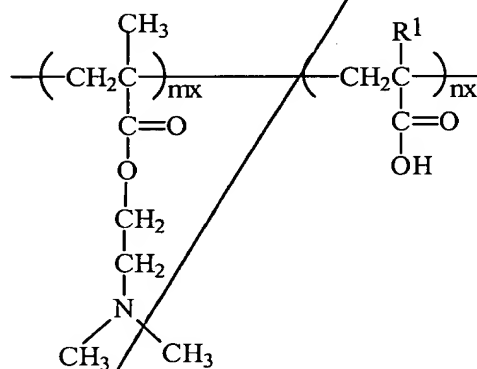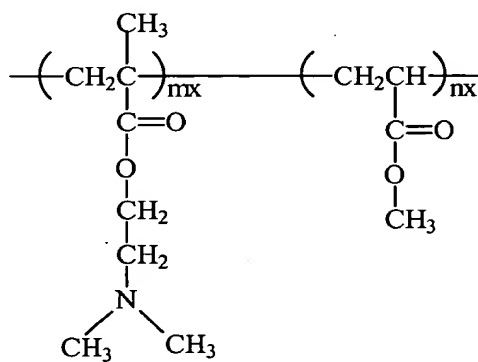
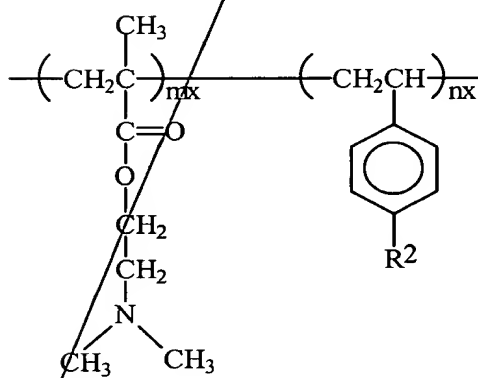$NH_2 \cdot HCl$

$+(CH_2C)+$
$\quad\ \ H$

O

CH_2

CH_2

N

$CH_2 \quad CH_2$

$CH_3 \quad CH_3$,

Sub QI cont. *Sub A1*

[Chemical structure: repeating unit with $CH_3\!-\!N\!-\!(CH_2CH_2O)_3\!-\!C(=O)$ pendant group]

[Chemical structure: morpholine-containing repeating unit, O, $N\!-\!(CH_2)_2\!-\!O\!-\!C(=O)$],

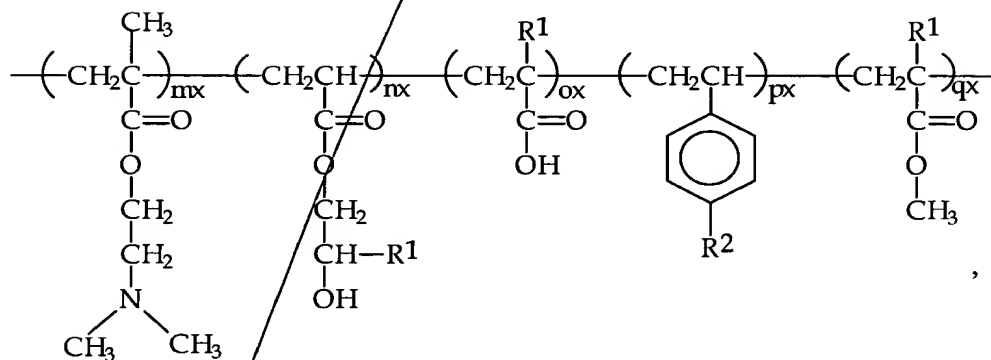[Chemical structure: piperazine-containing repeating unit, NH-piperazine-$N\!-\!C(=O)$]
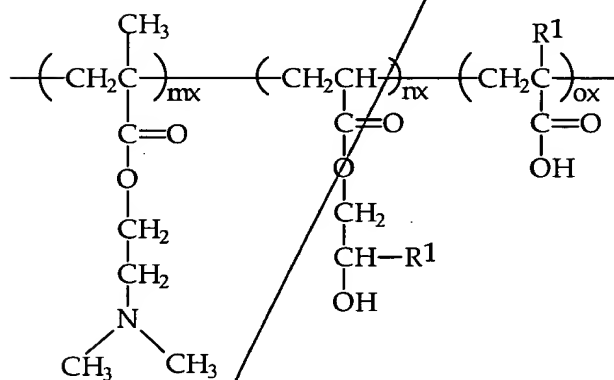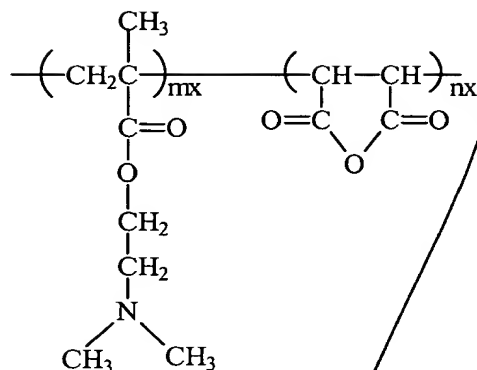
10. The block polymer according to Claim 1 wherein the block polymer is selected from the group consisting of:

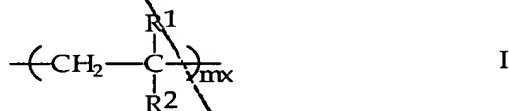$$\left(\!CH_2\underset{\underset{\underset{\underset{\underset{\underset{N}{CH_2}}{CH_2}}{O}}{C=O}}{\overset{CH_3}{C}}\!\right)_{mx}\left(\!CH_2\underset{\underset{OH}{C=O}}{\overset{R^1}{C}}\!\right)_{nx}$$

with the dimethylamino group $N(CH_3)(CH_3)$ on the first unit,

$$\left(\!CH_2\overset{CH_3}{\underset{C=O}{C}}\!\right)_{mx}\left(\!CH_2CH\!\right)_{nx}$$

with the first unit bearing $-C(=O)-O-CH_2-CH_2-N(CH_3)(CH_3)$ and the second unit bearing $-C(=O)-O-CH_2-CH(-R^1)-OH$,

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$$\left(CH_2\underset{\underset{\underset{\underset{\underset{CH_3}{N}}{CH_2}}{CH_2}}{\overset{CH_3}{\overset{|}{C}}\atop\overset{|}{C=O}\atop\overset{|}{O}}}\right)_{mx}\left(CH_2CH\right)_{nx}$$

,

$$\left(CH_2\overset{CH_3}{\underset{C=O}{\overset{|}{C}}}\right)_{mx}\left(CH_2CH\right)_{nx}$$

with R^2 on the benzene ring

,

$$\left(CH_2C\right)_{mx}\left(CH_2CH\right)_{nx}$$

with OCH_3 ester and $N(CH_3)_2$ groups

,

$$-\left(CH_2\overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle \underset{\underset{\underset{\underset{N}{|}}{CH_2}}{CH_2}}{O}}{C=O}}{C}}\right)_{mx}-\left(CH-CH\right)_{nx}$$

$-\!\!\left(\!CH_2C\!\right)_{mx}\!\!-\!\!\left(\!CH_2CH\!\right)_{nx}\!\!-\!\!\left(\!CH_2C\!\right)_{ox}$

$-\!\!\left(\!CH_2C\!\right)_{mx}\!\!-\!\!\left(\!CH_2CH\!\right)_{nx}\!\!-\!\!\left(\!CH_2C\!\right)_{ox}\!\!-\!\!\left(\!CH_2CH\!\right)_{px}\!\!-\!\!\left(\!CH_2C\!\right)_{qx}$
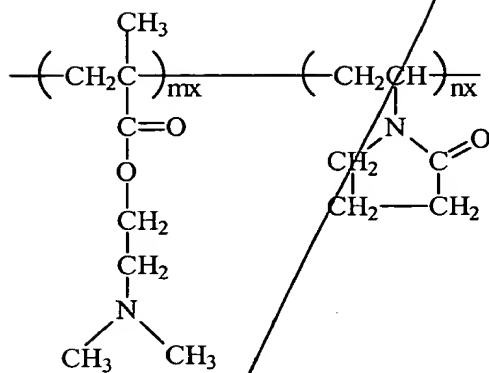
wherein R^1 is selected from H and CH_3; R^2 is selected from H and SO_3H; x represents the total number of monomer units within the block polymer; m, n, o, p, q when present, represent the mole ratio of their respective monomeric units in a given block polymer where at least two different monomeric units are present in the block polymer.

1.	A block polymer comprising at least a first homopolymeric unit comprising a series of first cationic monomeric units and at least a second hompolymeric unit comprising a series of second polymeric units,

5	at least said first monomeric units capable of having a cationic charge at a pH of from about 4 to about 12;

provided that said polymer has an average cationic charge density from about 0.05 to about 5 units per 100 daltons molecular weight at a pH of from about 4 to about 12.

10	12.	A block polymer comprising at least one homopolymeric block of monomeric units A and at least one member of the group consisting of a homopolymeric block of monomeric units B and a homopolymeric block of monomeric units C:

A.	said block of cationic monomeric units A having a Formula I:

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$$-\left(CH_2-\underset{\underset{R2}{|}}{\overset{\overset{R1}{|}}{C}}\right)_{mx}\qquad\qquad I$$

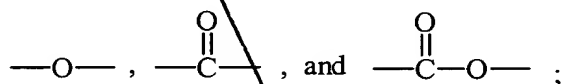wherein R^1 is H or an alkyl having 1 to 10 carbon atoms,

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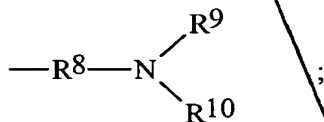R^2 is a moiety selected from the group consisting of
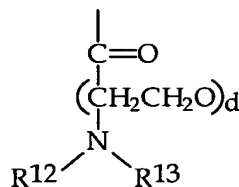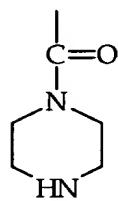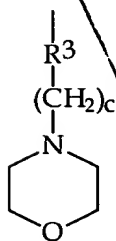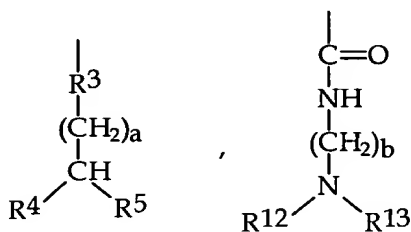
wherein R^3 is selected from the group consisting of

a is an integer from 0 to 16; b is an integer from 2 to 10; c is an integer from 2 to 10; d is an integer from 1 to 100;

R⁴ and R⁵ are independently selected from the group consisting of -H, and

R^8 is independently selected from the group consisting of a bond and an alkylene having 1 to 18 carbon atoms;

R^9 and R^{10} are independently selected from the group consisting of -H, alkyl having 1 to 10 carbon atoms;
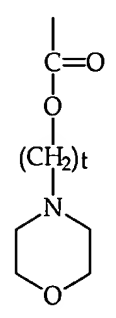
R^{12} and R^{13} are independently selected from the group consisting of H and alkyl having from 1 to 10 carbon atoms;

$$
\begin{array}{c}
\mid \\
N \\
CH_2 \quad CH_2 \\
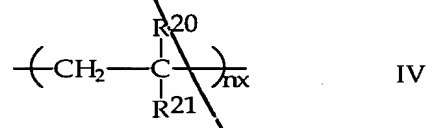CH_2 \quad CH_2 \\
NH
\end{array}
$$

$$C=O$$
$$O$$
$$(CH_2)t$$
$$N$$
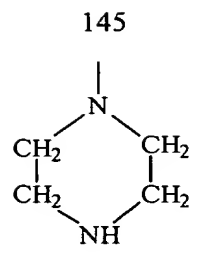
wherein t is an integer from 2 to 10;

B. said monomeric unit B is selected from the group consisting of:
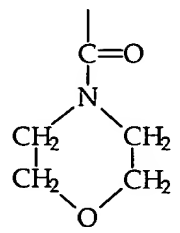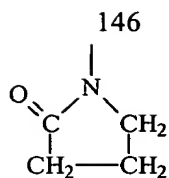
a monomeric unit of Formula IV

$$
-(CH_2-\underset{R^{21}}{\overset{R^{20}}{C}})_{nx} \qquad \text{IV}
$$

wherein R^{20} is selected from the group consisting of H and CH_3;

R^{21} is selected from the group consisting of:

$$C=O$$
$$
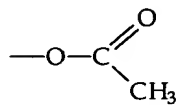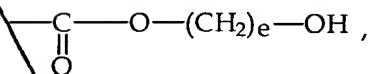\begin{array}{c}
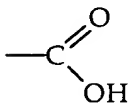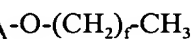N \\
CH_2 \quad CH_2 \\
CH_2 \quad CH_2 \\
O
\end{array}
$$
,

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,

,

—OH

,

,

$$\underset{O}{\overset{}{-C}}-O-(CH_2)_e-OH \;,$$

wherein e is an integer from 3 to 25;

$$-O-(CH_2)_f-CH_3$$

wherein f is an integer from 0 to 25;

$$\overset{O}{\overset{\|}{-C}}-O\!\left(\!\overset{R^{23}}{\underset{}{CH}}CH_2O\!\right)_{\!g}\!-H \;,$$

$$\overset{O}{\overset{\|}{-C}}-O\!\left(\!CH_2\overset{R^{24}}{\underset{}{CH}}O\!\right)_{\!h}\!-H \;,$$
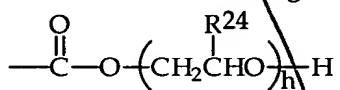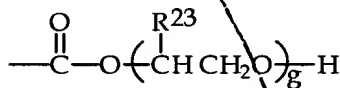
wherein g is an integer from 1 to 100,

h is an integer from 1 to 100,

R^{23} is -H, -CH$_3$ or -C$_2$H$_5$,

R^{24} is -CH$_3$ or -C$_2$H$_5$;

$$\overset{O}{\overset{\|}{-C}}-NH-(CH_2)_j-OH$$
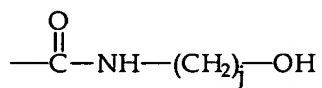
wherein j is an integer from 1 to 25;

$$\underset{O}{\overset{O}{\underset{\|}{-C}}}-NH-CH_2-\underset{CH_3}{\overset{CH_3}{\underset{|}{CH}}}-OH \quad ;$$
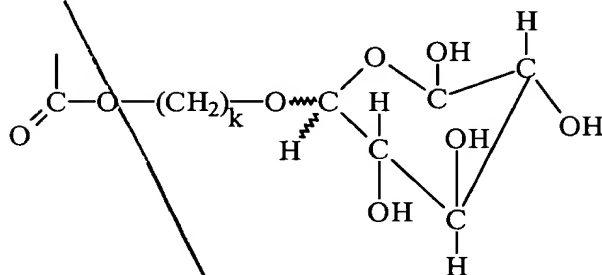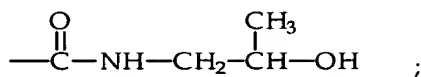
wherein k is an integer from 1 to 25;

$$\underset{SO_3H}{\text{(benzene ring)}} \quad ;$$
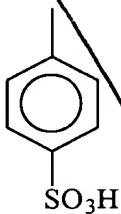
$-NH-(CH_2)_r-NH_2 \cdot HCl$, wherein r is an integer from 1 to 25; and

a polyhydroxy monomeric unit of Formula VI:

$$-O-\left(\underset{CH}{\overset{OH}{\underset{|}{CH}}}-\underset{CH}{\overset{OH}{\underset{|}{CH}}}\right)_w \qquad VI$$
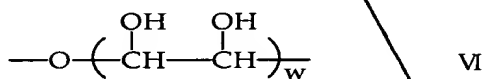
wherein w is an integer from 1 to 50; and

C.   monomeric unit C is selected from the group consisting of:

$$-\left(CH_2-\underset{\underset{OH}{C=O}}{\overset{R^{25}}{\underset{|}{C}}}\right)_{ox}-$$
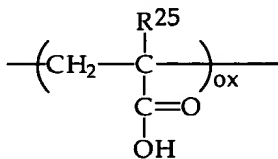
wherein R^{25} is -H or -CH$_3$,

$$\left(\!CH\!-\!CH\!\right)_{\overline{ox}}$$
$$O\!=\!C \quad C\!=\!O$$
$$O$$

and

$$\left(\!CH_2CH\!\right)_{\overline{ox}}$$

R26
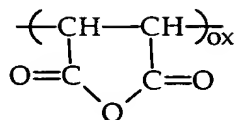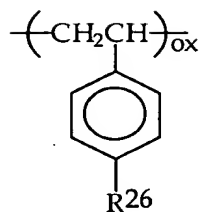
wherein R^{26} is -H or CH$_3$, and

x represents the total number of monomeric units within the block polymer; m, n, o, when present, represent the mole ratio of their respective monomeric units in a given block polymer, wherein at least two different monomeric units are present in the block polymer.

13. The block polymer of Claim 12, wherein m is greater than 1, n is greater than 1 and o is greater than 1.

14. The block polymer of Claim 12, wherein said polymer comprises at least one said monomeric unit A, at least one said monomeric unit B and at least one said monomeric unit C.

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15. The block polymer of Claim 12, wherein said at least one monomeric unit A is selected from the group consisting of:

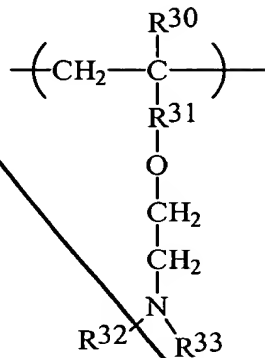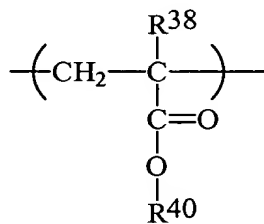$$\left(CH_2-\underset{\underset{\displaystyle R^{31}}{\overset{\displaystyle R^{30}}{|}}{C}\right)$$

$$\begin{array}{c} | \\ O \\ | \\ CH_2 \\ | \\ CH_2 \\ | \\ N \\ R^{32} \diagup \quad \diagdown R^{33} \end{array}$$

wherein R^{30} is H or $-CH_3$,

wherein R^{31} is a bond or $-\overset{\overset{\displaystyle O}{\|}}{C}-$, and

R^{32} and R^{33} are $-CH_3$ or $-C_2H_5$.

16. The polymer of Claim 15, wherein said polymer is a terpolymer, said at least one monomeric unit B is selected from the group consisting of:

$$\left(CH_2-\underset{\underset{\displaystyle R^{40}}{\overset{\displaystyle |}{\underset{\displaystyle |}{O}}}{\underset{\displaystyle \|}{\underset{\displaystyle C=O}{\overset{\displaystyle R^{38}}{|}}}{C}}\right)$$

wherein R^{38} is selected from the group consisting of H and CH_3 and

R^{40} is selected from the group consisting of $-CH_2CH_2-OH$ and

$$-CH_2-\underset{\overset{\displaystyle |}{\underset{\displaystyle OH}{}}}{CH}-CH_3 \quad ,$$
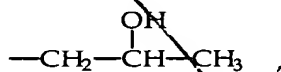
and isomers thereof,

said terpolymer comprising said at least one monomeric unit C,

wherein the molar ratio of said monomeric unit A : monomeric unit B : monomeric unit C is 1 to 9 : 1 to 9 : 1 to 6 respectively.

17.   The block polymer of Claim 12, wherein the at least one monomeric unit B has the formula:

$$-\left(CH_2-CH\right)-$$

with the side group
$$\begin{array}{c} C=O \\ | \\ O \\ | \\ \left(CH_2CH_2O\right)_q-H \end{array}$$

wherein q ranges from 1 to 12.

18.   The block polymer of Claim 17, wherein the polymer is a terpolymer, said at least one monomeric unit A is selected from the group consisting of:
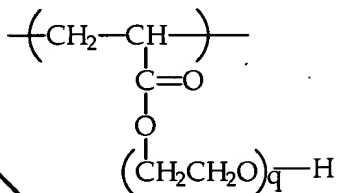
$$-\left(CH_2-\underset{\underset{R^{11}}{|}}{\overset{\overset{R^{10}}{|}}{C}}\right)-$$

with the side group
$$\begin{array}{c} O \\ | \\ CH_2 \\ | \\ CH_2 \\ | \\ N \\ R^{12} \diagup \quad \diagdown R^{13} \end{array}$$

wherein R^{10} is H or CH$_3$,

R^{11} is a bond or ―C(=O)― , and R^{12} and R^{13} are –CH$_3$ or –C$_2$H$_5$, and said monomer comprises said at least one monomeric unit C.

19. The polymer of Claim 18, wherein the molar ratio of monomeric unit A : monomeric unit B : monomeric unit C ranges from 1 to 9 : 1 to 9 : 1 to 3 respectively.
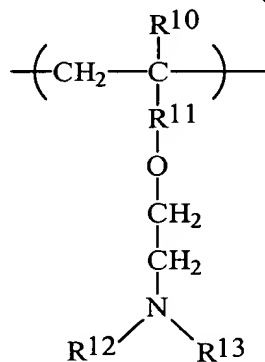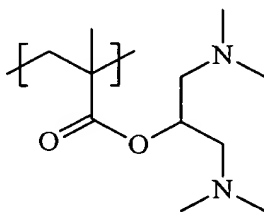
20. The block polymer of Claim 12, wherein said at least one monomeric unit A has a formula selected from the group consisting of:

and
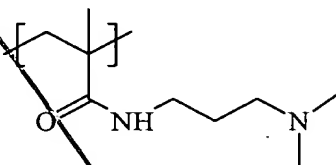
21. The block polymer of Claim 12, wherein said at least one monomeric unit B has a formula selected from the group consisting of:

,

and

22.   The block polymer of Claim 12, wherein said at least one monomeric unit B is selected from the group consisting of:
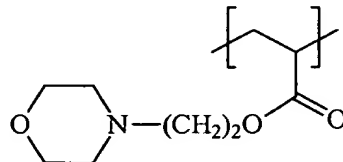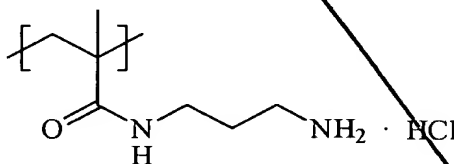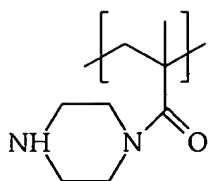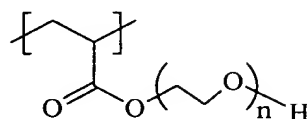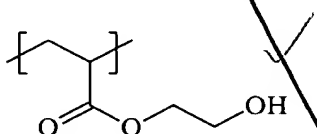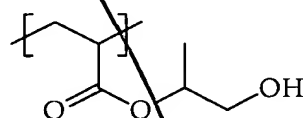
wherein n is an integer from 1 to 50, preferably 2 to 30, more preferably 7 to 27,

$$\cdots(CH_2-C)\cdots$$
$$\underset{\underset{\displaystyle OH}{\underset{|}{\displaystyle CH_2}}}{\overset{\underset{\displaystyle O}{\overset{|}{\displaystyle C=O}}}{\overset{|}{\displaystyle O}}}\!\!\!-\!\!O\!\!-\!\!CH_2CH_2CH_2CH_2\!\!-\!\!OH$$

$$\cdots\!\!\left(CH_2\underset{\displaystyle \overset{|}{O}}{\overset{\displaystyle \overset{H}{|}}{C}}\right)\!\!\cdots$$
$$\underset{\displaystyle OH}{\underset{|}{\underset{\displaystyle CH_2}{\underset{|}{\displaystyle CH_2}}}}$$
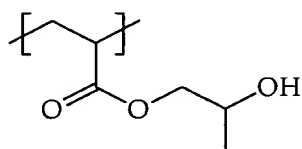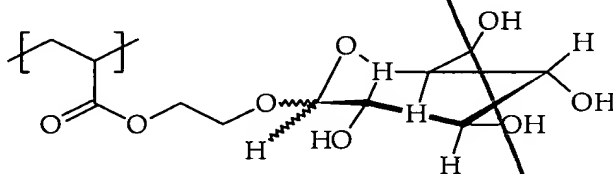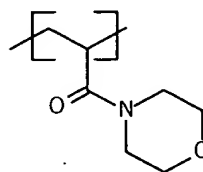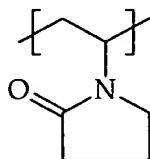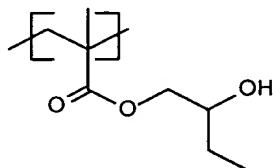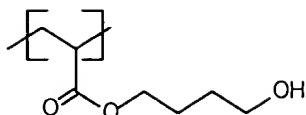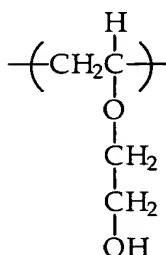
23.   The block polymer of Claim 12, selected from the group consisting of:

poly(HEA-co-DMAM-co-AA) terpolymer,

poly(HPA-co-DMAM-co-AA) terpolymer, and

poly(PEG-acrylate-co-DMAM-co-AA) terpolymer.

24.   The polymer of Claim 12, selected from the group consisting of:

poly(HEA-co-DMAM) copolymer, poly(DMAM-co-butylvinylether) copolymer and poly(2-diethylaminoethylvinyl ether-co-ethyleneglycol monovinyl ether).

25.   A method for cleaning hair or skin comprising applying an effective amount of a cleaning composition comprising the polymer of Claim 1 and at least one detersive surfactant to hair or skin in need of cleaning, provided that a 10% aqueous solution of said composition has a pH from about 4 to about 9.

26.   The method of Claim 25, wherein said composition further comprises at least one member of the group consisting of a pearlizing agent, a silicone hair conditioning agent, and an antidandruff ingredient.

27. The method of Claim 26, wherein said composition comprises:

a) said pearlizing agent

b) a nonionic surfactant

c) an amphoteric surfactant

d) a glycol emulsifier

e) water.

28. The method of Claim 26, wherein said composition comprises at least one amphoteric surfactant and said amphoteric surfactant comprises at least one member of the group consisting of:

the alkali salts of alkyl amphodipropionates, alkyl amphodiacetates, alkyl amphoglycinates, alkyl amphopropyl sulfonates and alkyl amphopropionates wherein alkyl represents an alkyl group having 6 to 20 carbon atoms.

29. The method of Claim 28, wherein in said at least one amphoteric surfactant the alkyl group is derived from coconut oil or is a lauryl group.

30. A method for cleaning hair or skin comprising applying an effective amount of a cleaning composition comprising the polymer of Claim 13 and at least one surfactant to hair or skin in need of cleaning.

31. A composition for cleaning hair or skin comprising:

the block polymer of Claim 1,

at least one detersive surfactant, and at least one member of the group consisting of a pearlizing agent, a silicone hair conditioning agent, and an antidandruff ingredient, provided that a 10% aqueous solution of said composition has a pH from about 4 to about 12.

32. A composition for cleaning hair or skin comprising:

the block polymer of Claim 12,

at least one surfactant, and at least one member of the group consisting of a pearlizing agent, a silicone hair conditioning agent, and an antidandruff ingredient.

33. The composition of Claim 32, wherein said silicone compound is an alpha, omega-trimethylsilyl-polydimethylsioloxane having a viscosity at 25°C of at least 25 centistokes and less than 60,000 centistokes.

34. A method for washing a fabric article in a washing medium comprising:

applying an effective amount of a laundry cleaning composition comprising the polymer of Claim 1 and at least one detergent surfactant to a fabric article in need of cleaning.

35. The method of Claim 34, wherein said composition washes a colored fabric article.

36. The method of Claim 34, wherein said composition comprises at least one member of the group consisting of an aminosilione, a Gemini surfactant, a detergency builder, a bleach, an activator for percompound bleach, a soil suspending agent, a soil antiredeposition agent, a foam suppressant agent and a fabric softener.

37. The method of Claim 34, wherein said composition comprises a foam suppressant agent.

38. A method for washing a fabric article in a washing medium comprising:

applying an effective amount of a laundry cleaning composition the polymer of Claim 13 and at least one detergent surfactant to a fabric article in need of cleaning.

39. A composition for washing a fabric article comprising:

the polymer of Claim 1;

at least one detergent surfactant; and

at least one member of the group consisting of an aminosilicone, a Gemini surfactant, a detergency builder, a bleach, an activator for percompound bleach, a soil suspending agent, a soil antiredeposition agent, a foam suppressant agent and a fabric softener.

40. A method for extinguishing fire comprising applying a foam to a fire, wherein the foam comprises a foaming agent and a polymer of Claim 1.

41. A method for treating at least one agricultural substrate selected from the group consisting of plants, seeds and soil comprising,

applying to the substrate a foam comprising at least one agricultural chemical selected from the group consisting of a herbicide, a pesticide, and a fungicide, a foaming agent and a polymer of Claim 1.

42. A method comprising, injecting into a subterranean formation, a foam comprising a foaming agent and a polymer of Claim 1.

43. A method comprising shaving hair from skin comprising applying foam shaving cream to the skin, said shaving cream comprising a foaming agent and a polymer of Claim 1.

44. A method comprising shaving hair from skin comprising applying a shaving gel to the skin, said gel comprising a foaming agent and a polymer of Claim 1.

45. A method for removing hair from skin comprising applying a dephiliatory foam to skin, said foam comprising a foaming agent and a block polymer of Claim 1.

46. A method of cleaning hard bathroom surfaces comprising applying to said surfaces a foam cleaner comprising a foaming agent and a polymer of Claim 1.

47. A process for making paper comprising aiding retention of titanium dioxide on the paper during the paper making comprising treating the paper with an aqueous solution comprising titanium dioxide and a polymer of Claim 1.